veski

veski innovation fellow

Professor Richard Sandberg

research project

Impacting industry by enabling a step-change in simulation fidelity for flow and noise problems

project summary

Using a numerical code developed over the past seven years in the UK and US, Professor Richard Sandberg will harness the power of Australia's and the world's high-performance super computers to gain better understanding of turbulence and to develop new models for industry to reduce noise and predict turbulence.

Advances in fluid dynamics research, made possible through computer simulations, play a role in almost every aspect of Australian life. Professor Sandberg's research can lead to more efficient conventional and renewable power generation, more environmentally friendly and affordable plane travel, and improved heating and cooling systems.

Through an integrated research and education program, Professor Sandberg's research team will use modern supercomputers as 'time machines', enabling flow and noise predictions with unprecedented accuracy to help design the next generations of 'green' engineering devices decades earlier than otherwise possible.

The research will not only have a scientific and economic impact but will ultimately benefit Australian society by creating new knowledge and training for the next generation of engineers and scientists. This training is fundamental for future advances in engineering in Australia enabled by high-performance computing.

The project will also move Victoria, and the University of Melbourne, from a reliance on traditional experimentations with wind tunnels to a process of numerical validation using simulations that have already demonstrated potential.

As well as bringing the scientific and technical brilliance needed to simulate these experiments, Richard will focus on supporting greater industry and academic collaborations.

personal history

Professor Richard Sandberg is a world-leading expert in large-scale, high-fidelity simulation of turbulent flows and the associated noise generation. He moves to Australia from the UK to become a **veski** innovation fellow at the University of Melbourne.

Professor Sandberg has distinguished himself not only for his seminal fundamental contributions to the science in these areas, but also in translating these findings and new computational techniques into industrial applications.

As a distinguished scholar, he was one of the youngest ever to be appointed to Professor in his field in Southampton.

Professor Sandberg is a natural leader, with a clear vision and strategy of how to realise major initiatives. This is exemplified by his leadership of the UK Turbulence Consortium, a major national high performance computing centre in the UK involving 13 universities and more than 30 academics.

Milton House
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Professor Richard Sandberg

"It's very important to see industry engaging in the fundamental research that we do ... ultimately, I want to see that it's having a design impact."

He has also been a principal investigator for grants valued at more than £2 million and secured more than £12 million in research facility use from GE Global Research, GE Aviation, BAEsystems, Airbus, Vestas, EPSRC, Royal Society and the Royal Academy of Engineering.

Richard is the author or co-author of more than 100 publications including 36 in leading journals, and he is a great mentor of several post doctoral and PhD students.

He began his education in Germany, before relocating to the US where he gained a pivotal understanding of high-fidelity computational fluid dynamics which informed the development of the numerical code he brings to Victoria.

Richard relocates to Victoria with his family, including his wife who is a documentary filmmaker and two children.

other innovation fellowship recipients

Professor Andrew Holmes AM FRS FAA FTSE
Professor Marcus Pandy
Dr Gareth Forde
Dr Alyssa Barry
Professor Michael Cowley FTSE
Professor Sarah Hosking
Professor Ygal Haupt
Associate Professor Ross Dickins
Dr Mark Shackleton
Professor Edwin van Leeuwen FTSE
Dr Matthew Call
Associate Professor Christopher McNeill
Dr Seth Masters
Professor Tiffany Walsh
Professor Cameron Simmons
Dr Luke Connal
Professor Colette McKay
Dr Ethan Goddard-Borger
Associate Professor Mark Dawson
Professor Kenneth Crozier
Associate Professor Roger Pocock
Professor Colby Zaph

background information

veski delivers a range of Victoria's most prestigious science and innovation programs including the **veski** innovation fellowships which bring world-leading scientists and researchers back to Victoria.

Since 2004, 23 **veski** innovation fellows have returned to Victoria with funding worth more than $4 million delivering a return on investment in excess of $45 million. Their research covers semiconductors, epigenetics, audiology, optics and nanotechnology, enzymes, dengue, malaria, cancer, inflammatory diseases, musculoskeletal health, geothermal energy and obesity.

veski is supported by the State Government of Victoria.

further information

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State Government Victoria